Wave tank – set up instructions

Equipment needed:

Tank (with Perspex lid)

Arduino with power cable

Small screwdriver (to attach Arduino to water tank motor)

Power pack with black and red cables.

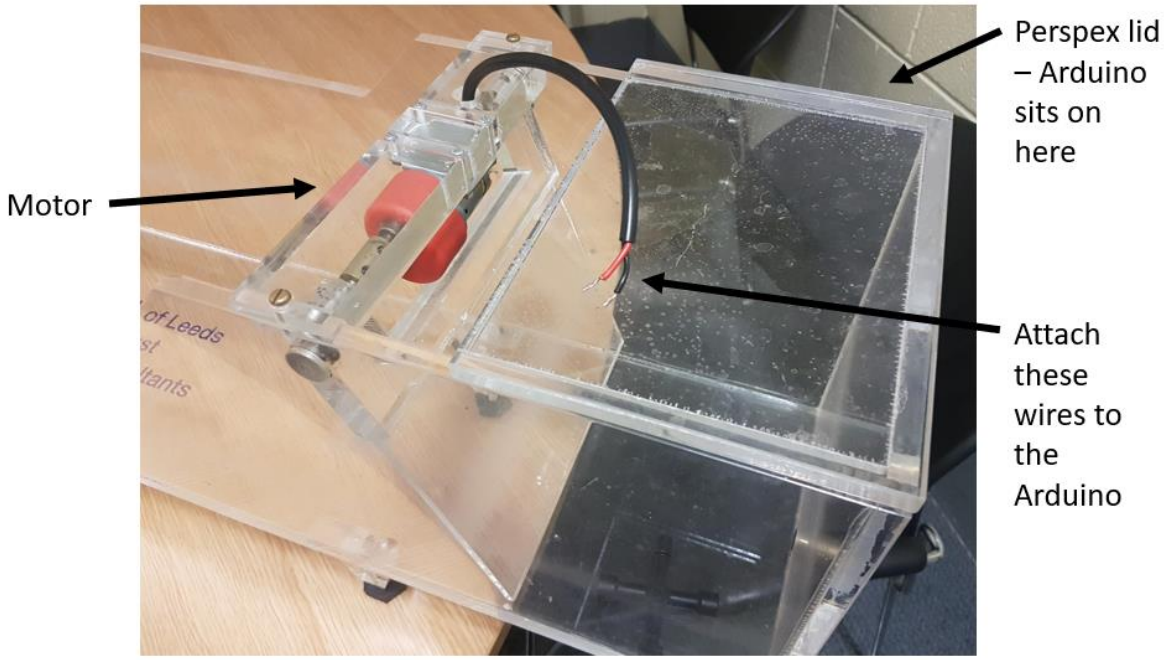
Tank additions: Sloped embankments (beaches), stepped embankments, off-shore wave-breaker, recurved wall (can be turned for flat wall), gabions.

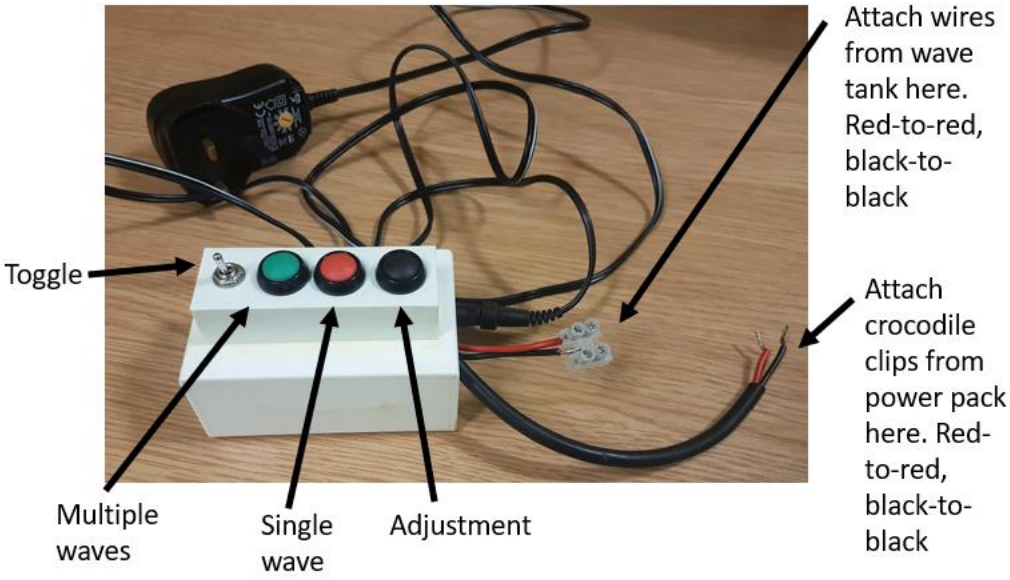
Four-edged valve turner

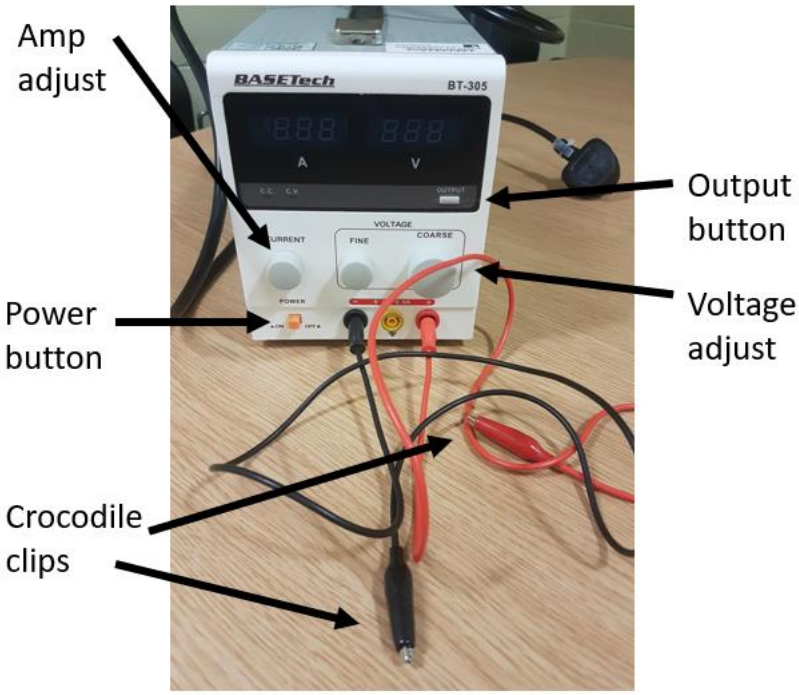
Screwdriver (to secure slopes and steps in place)

Bucket (and measuring jug)

Towels (for spills and clean up)




Attach wires from wave tank here. Red-to-red, black-to-black
Toggle
Attach crocodile clips from power pack here. Red-to-red, black-to-black
Multiple waves
Single wave
Adjustment


Amp adjust
BASETech
BT-305
A
V
Output button
VOLTAGE
FINE
COARSE
Power button
Voltage adjust
Crocodile clips

Four-edged valve turner

Brass valve

Set-up

1. Place the tank on a table such that the power pack and Arduino cables can be plugged into the mains. Arduino needs to sit on the Perspex lid. Keep the power pack and Arduino turned off until set up is complete. Make sure the tank is level on the table. The height can be adjusted by turning the feet on each of the corners.
2. Using a small screwdriver, attached the wires from the wave tank motor to the Arduino cable holders, matching colour to colour. Plug the red and black cables into the power pack (respective colour holes) and attached the crocodile ends of the clip to the bare Arduino wires (See photos).
3. Using the four-edged valve turner, make sure the brass valves at each end of tank are closed. Fill the tank with clean water using the bucket, filling the bucket only halfway for each journey to a tap. It will take a few buckets to fill. There is a red line on either side of the tank, fill to here. The tank is now set up.

Using the power pack and Arduino

1. Turn on both the power pack and Arduino on at the wall supply. The power pack has an on/off button and an output button. Power will not be supplied until the output button is pushed. Turn on the power pack and set the voltage to between 11-12V and the amps to 2A (do not use higher values, especially the voltage, these settings are sufficient).
2. Push the output button to power the motor. The Arduino controls the motor and the motor should not move until the Arduino buttons are pushed. Never directly connect the power pack to the motor as this could break the motor.
3. Use the black button to adjust the position of the wave generator. The toggle sets the direction. For the wave motions, the wave generator should be directly perpendicular to the base of the tank. To generate a single wave, hold the red button down. To generate multiple waves, hold the green button down. For the red and green button waves, the toggle changes the type of wave generated: either a normal wave or a standing wave. The standing wave moves faster so you will be able to distinguish between them.

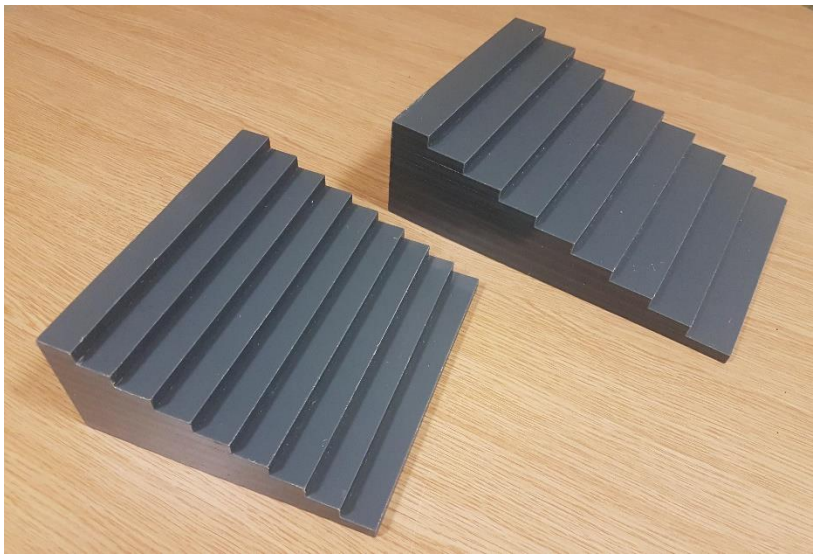
Wave defences

To learn what each of the wave defences does, refer to the JBA Trust Wave Tank Demonstration video on Youtube (Below). The 4:1 ramp will need screwing into place to ensure it doesn't float, and it is best to screw the other sloped and stepped defences in place too. There are a handful of screws on the side, which can be tightened using a normal size screwdriver to secure them in place.

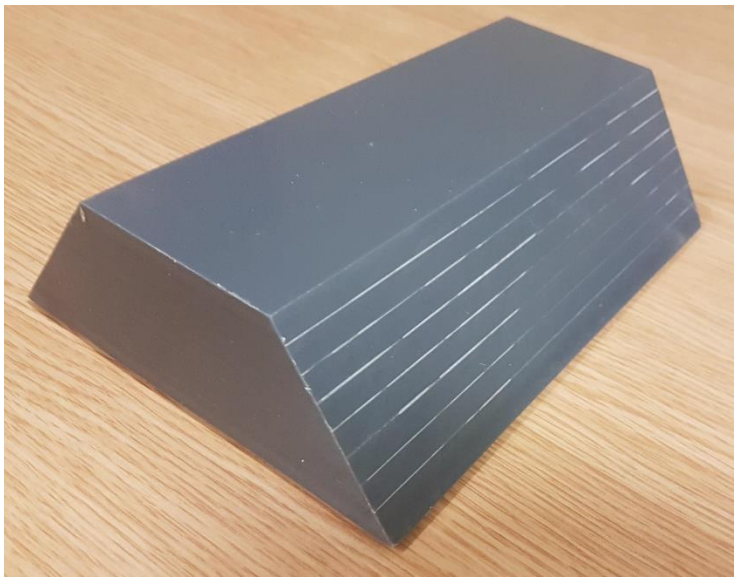
https://www.youtube.com/watch?v=3yNoy4H2Z-o&t=22s

Slopes (beach and sloped embankments)

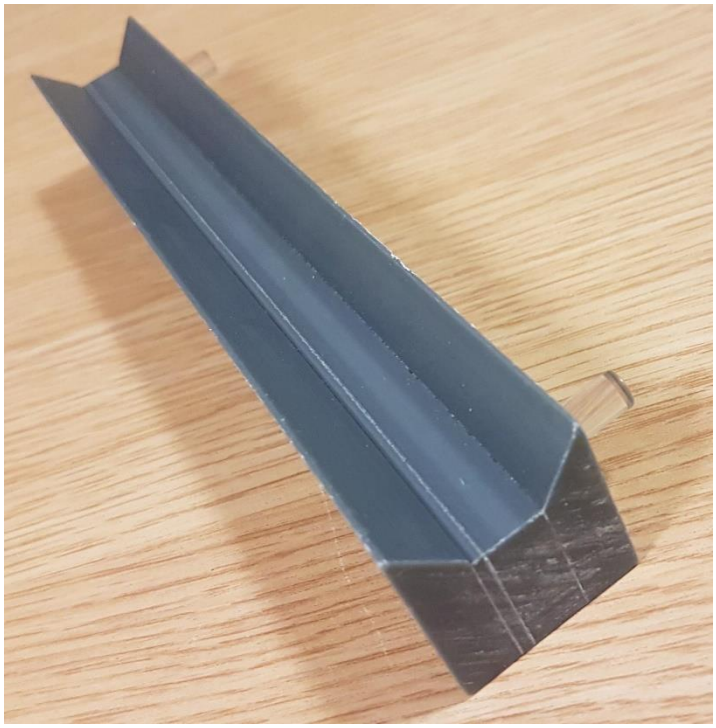
Stepped embankments



Off-shore wave-breaker



Recurved (and normal) wall



Gabions

Emptying the tank

1) Turn of the electronics and disconnect. Store them safely away from the tank. Remove the defences and let them dry on a towel.
2) Use the four-edged valve turner to loosen the brass valves at the bottom of the tank. The bolts can be loosened all the way but be careful as you'll need to screw it back it to stop the flow when the bucket is sufficiently full. Place the bucket underneath the stream to catch the emptying water. A measuring jug can be used to scoop out water from the tank to the bucket to speed up the drainage.